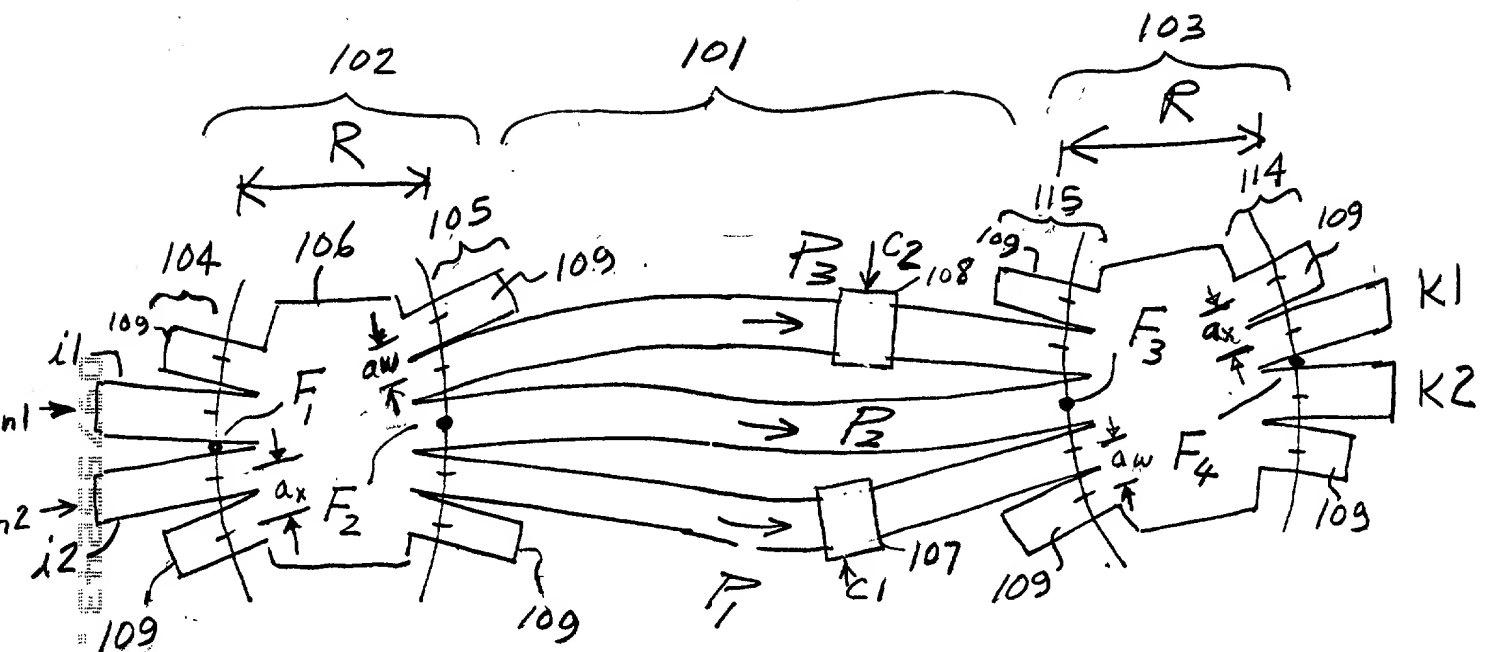


Fig 1



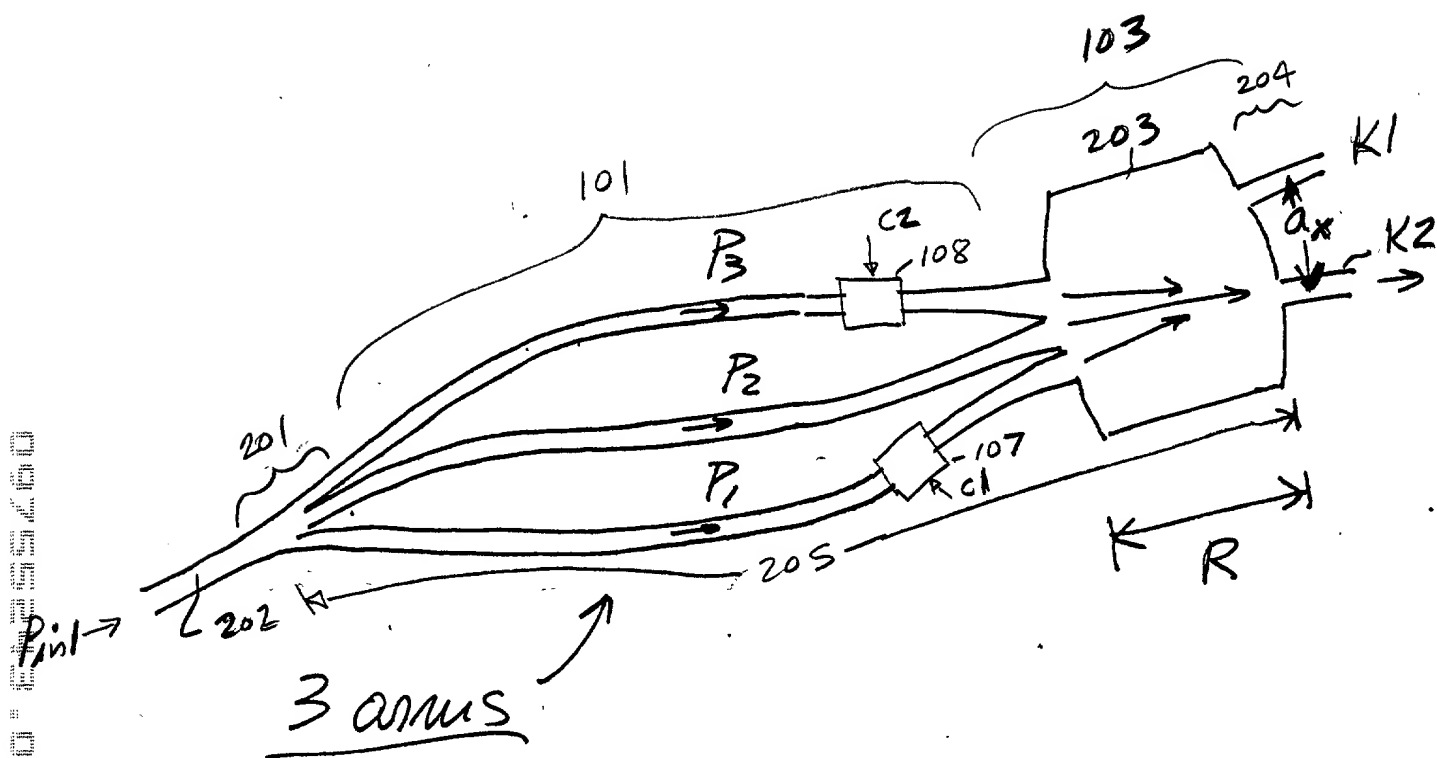


FIG. 2

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Principal Image

Input Circle

(A)

Output Circle

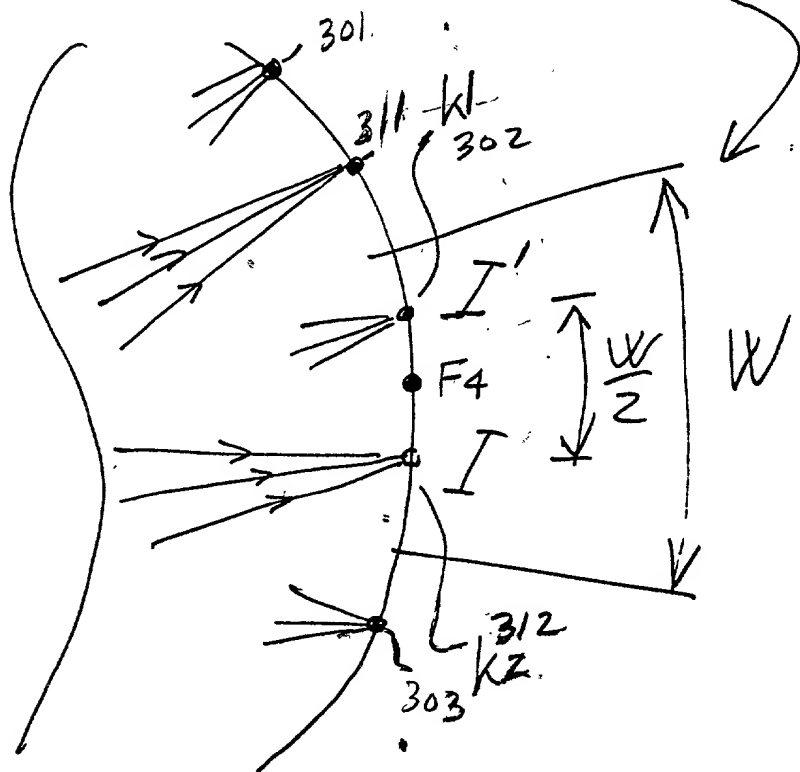
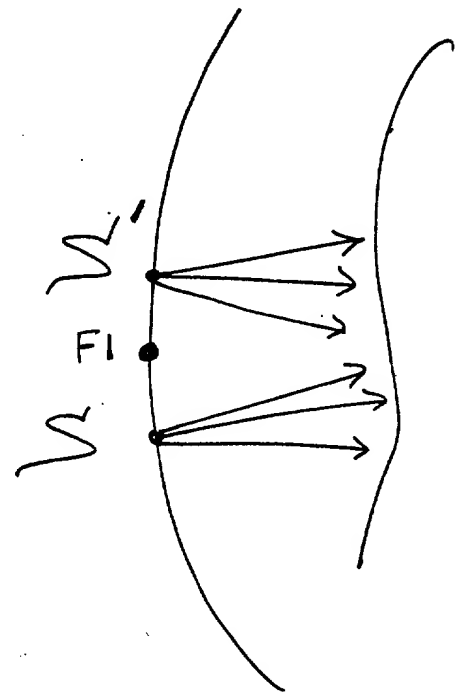
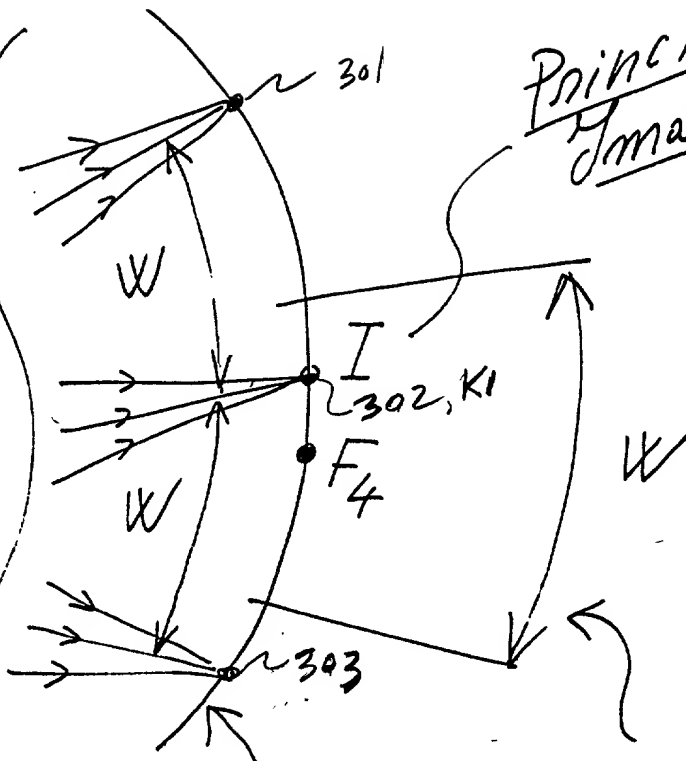
Central Zone

central zone

(B)

FIG. 3

F_1
 S



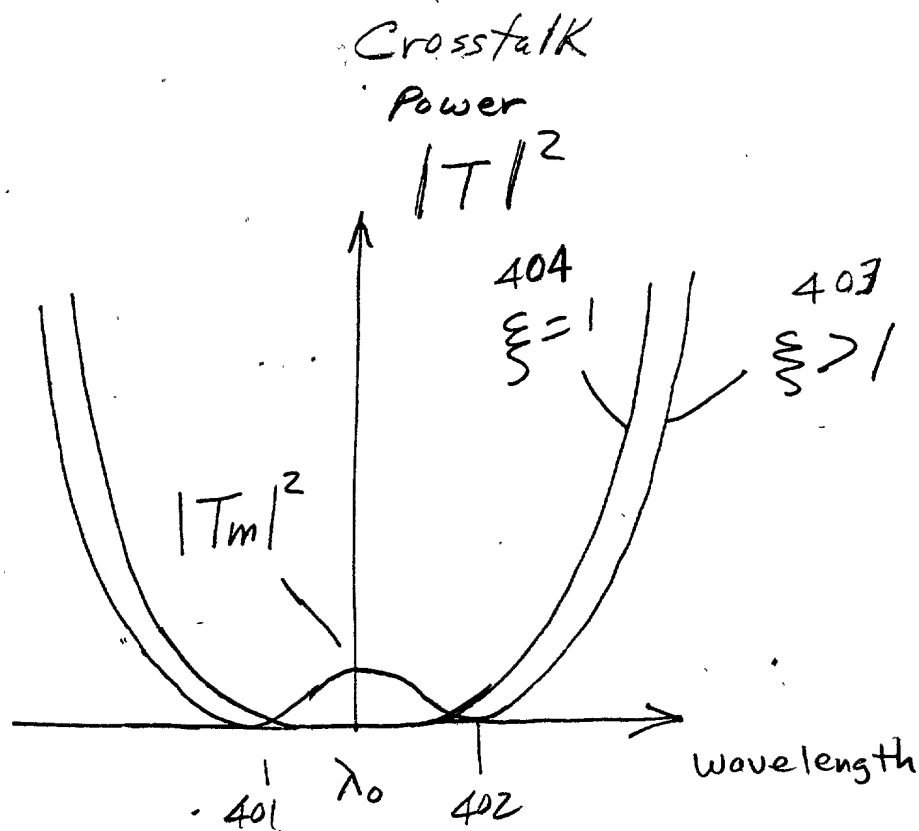


FIG. 4

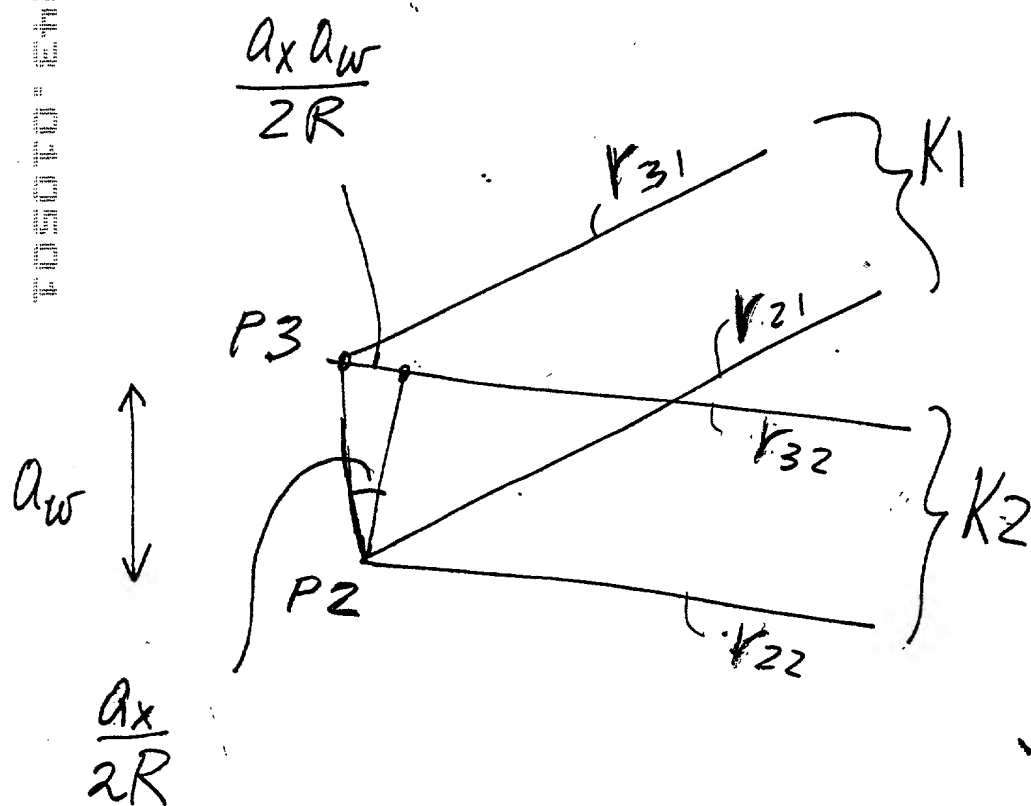
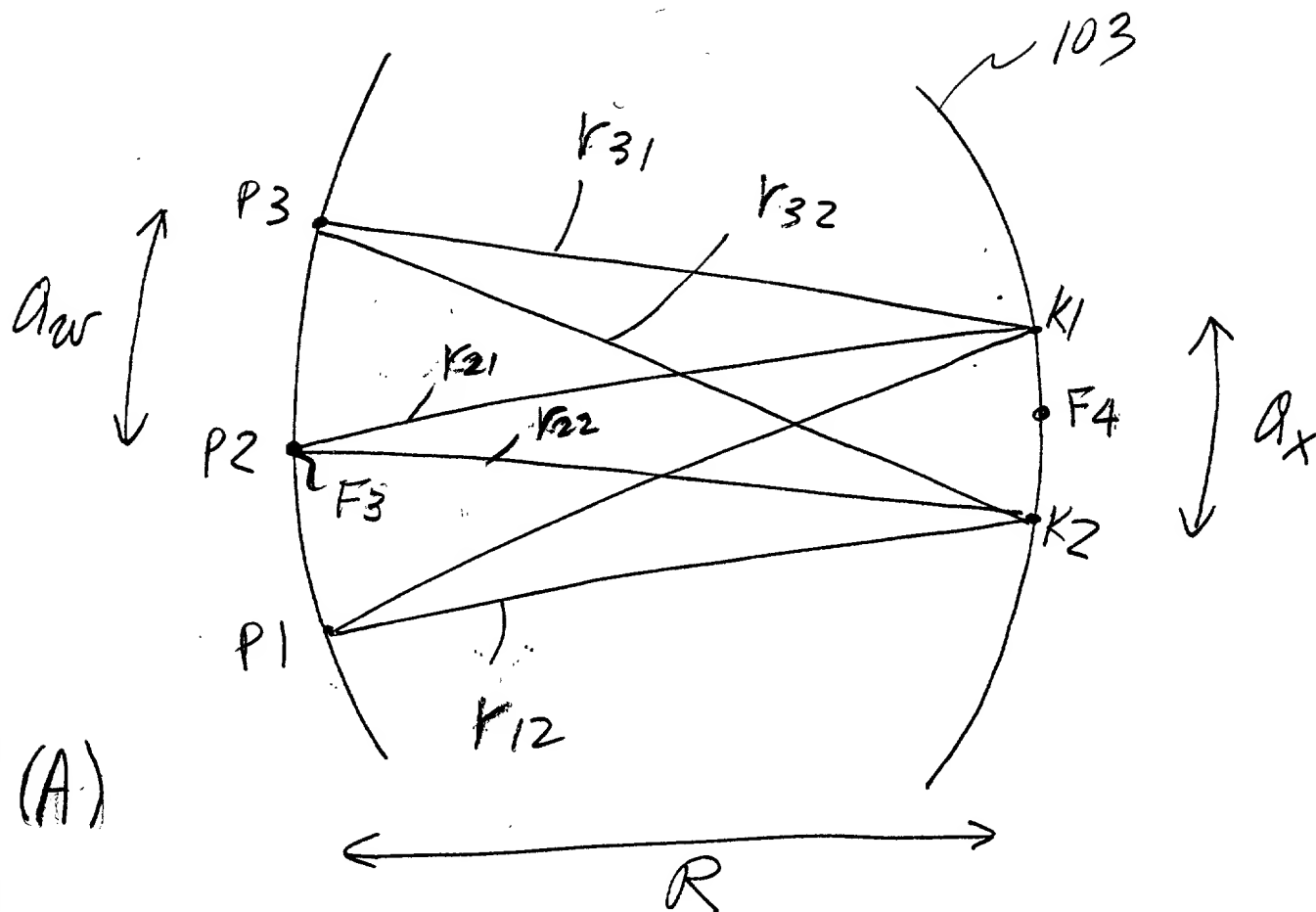
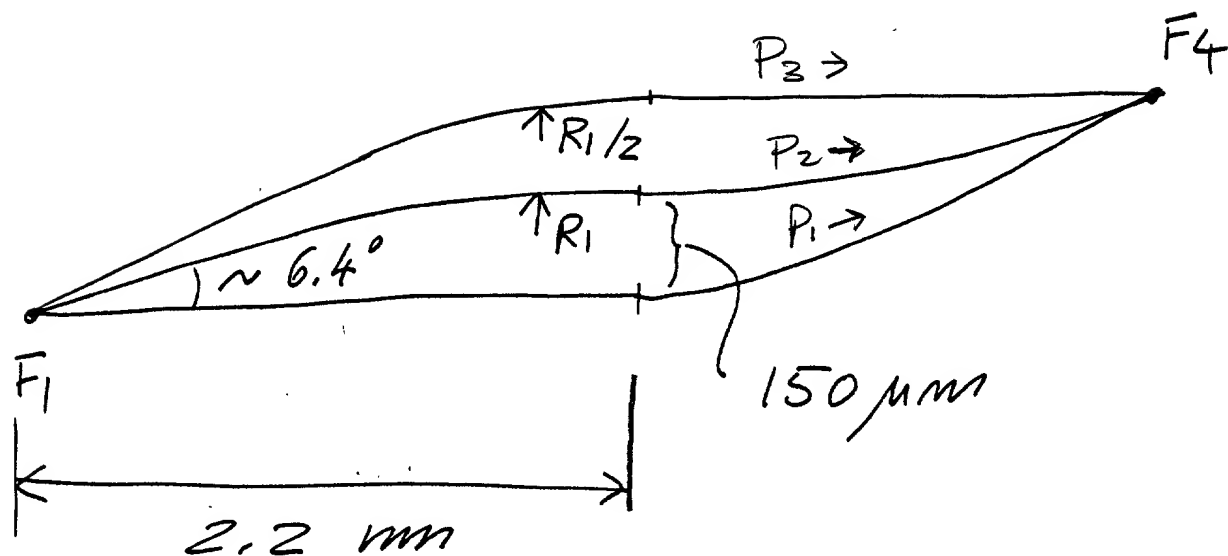


FIG. 5

(B)



$$R_1 = 30 \text{ mm}$$

$$a = 5 \mu\text{m}$$

$$R = 90 \mu\text{m}$$

$$\lambda_0 \approx 1 \mu\text{m}$$

$$n_0 = 1.445 \text{ (glass)}$$

$$\Delta n \approx 0.65\%$$

FIG. 6

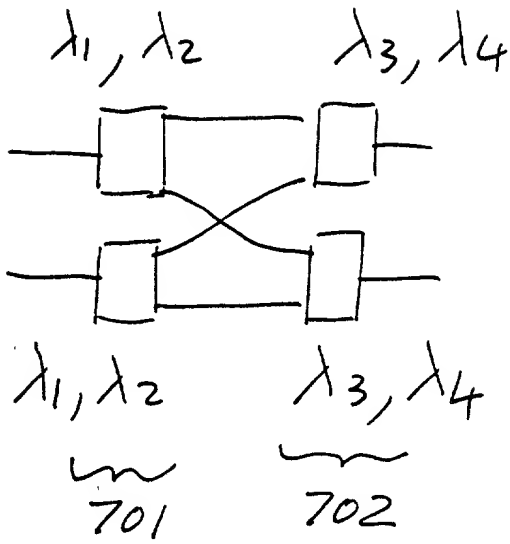


Fig. 7A

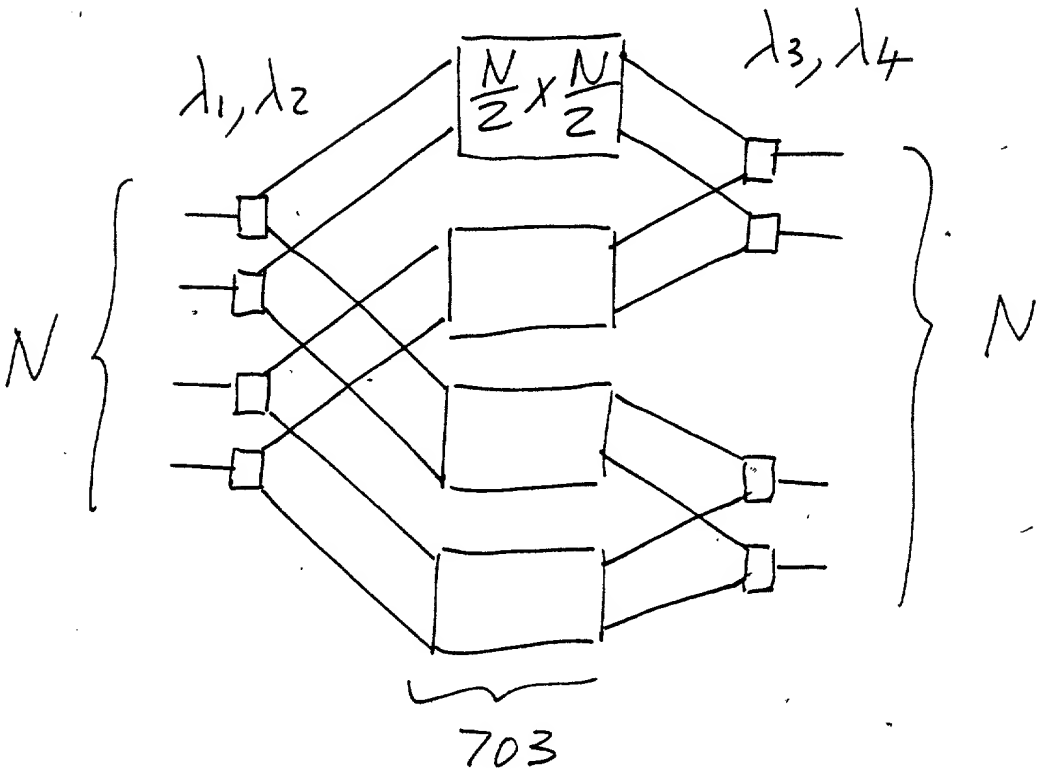


Fig. 7B

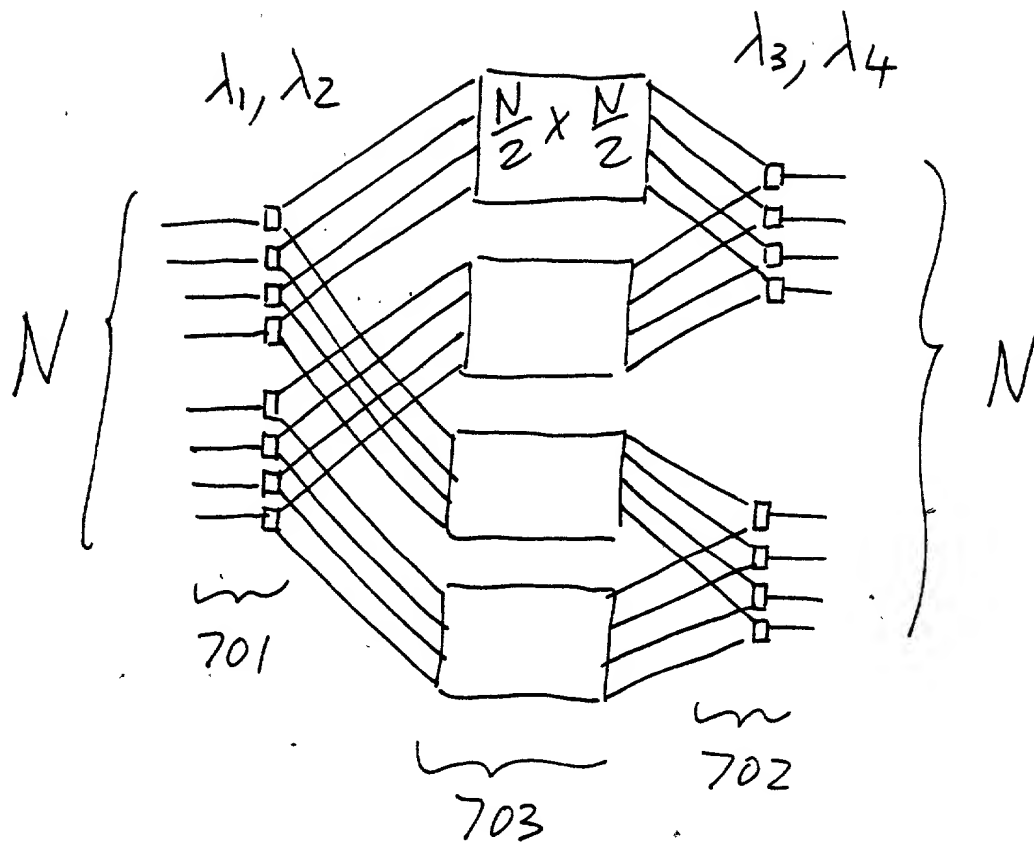


FIG. 7C

λ_1, λ_2

λ_3, λ_4

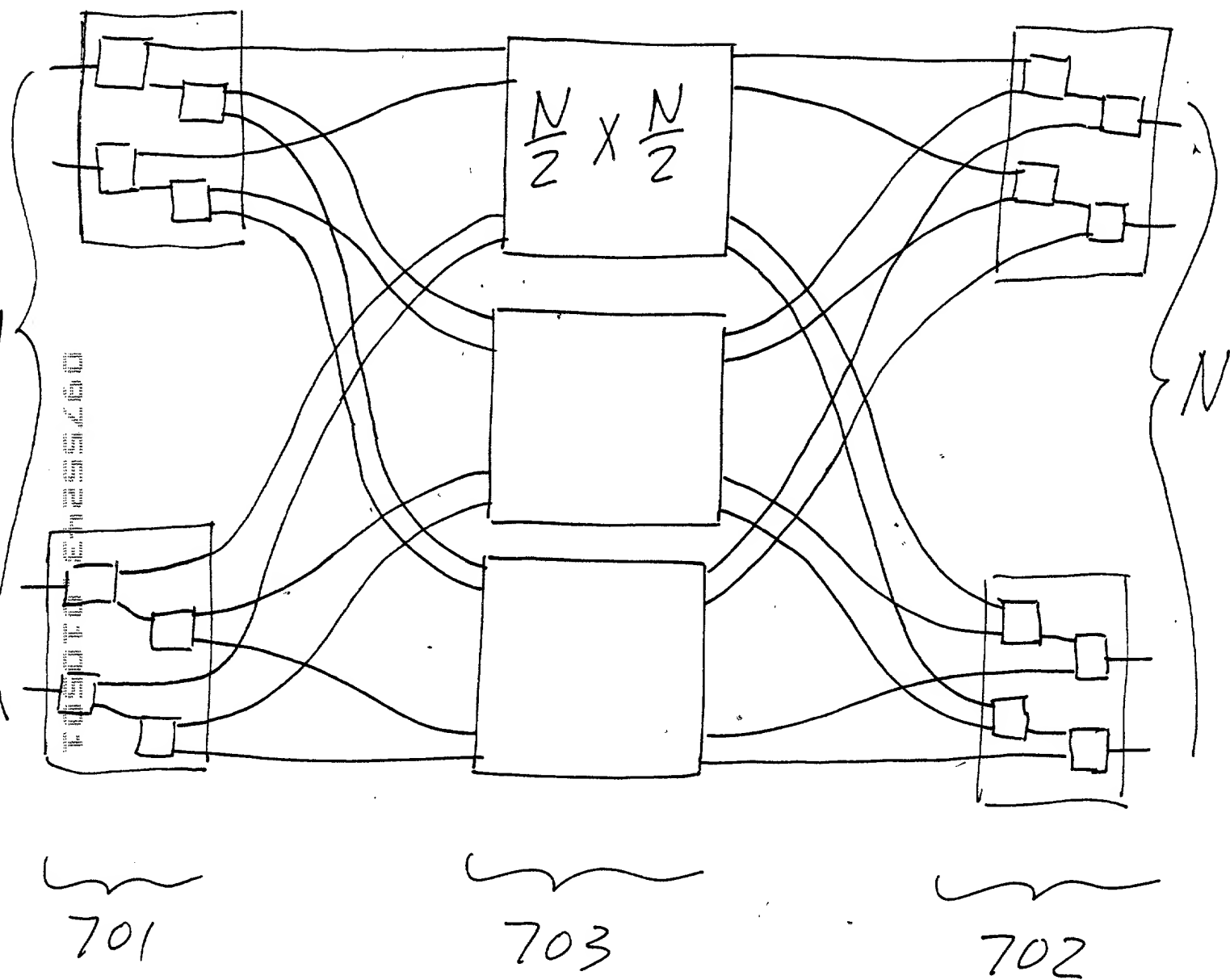


FIG. 7D

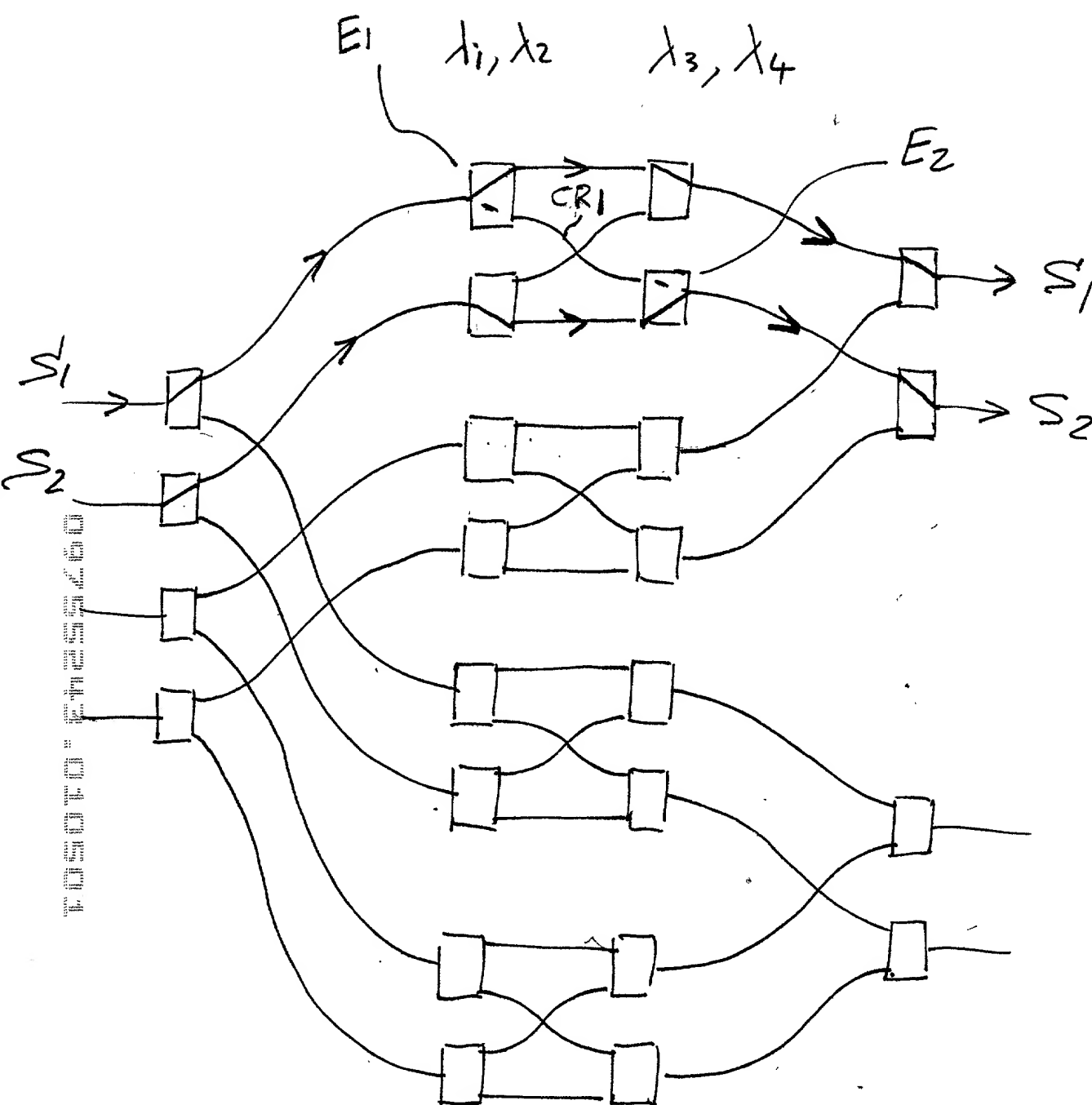


Fig 7E

Fig. 8

